

22. New or Little-known Reptiles and Batrachians from Southern Annam (Indo-China). By MALCOLM A. SMITH, M.R.C.S., L.R.C.P., F.Z.S.  
(Plates I.-II. and Text-figures 1-2.)

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The collection of Reptiles and Batrachians of which this paper is the subject was made in Southern Annam, chiefly on the Langbian Plateau, in March, April, and May, 1917. I was fortunate in having as my companion on the trip Mr. C. Boden Kloss, of the Selangor Museum, Federated Malay States, and as he was able to remain on in the country for several weeks after I had left, was the means of adding many valuable specimens to my collection.

The famous Plateau had long attracted us, as zoologically it was almost unknown; and as, owing to the war, we were unable to obtain home leave, of which we were badly in need, we decided to take advantage of a short holiday and visit this region. The enterprise of the French Government, too, in building a sanatorium at a high elevation, and in constructing fine roads up to it, rendered the plateau easily accessible, so that little time was wasted in travelling.

Our expectations of rich material were fully justified. The report on the birds by Messrs. Robinson and Kloss has already appeared in 'The Ibis' (July 1919), and a good account of the general conditions on the plateau has been given there by Mr. Kloss. It is unnecessary for me to repeat his remarks here, but for convenience I have recapitulated the camps at which collections were made. Starting from the sea-coast at Tour Cham, we gradually made our way up into the hills, our final camp being underneath the Langbian peaks at 2000 metres elevation.

I was accompanied by two trained native assistants. Altogether about 700 specimens were obtained. Many more of the common

forms could have been taken, but with a good series in hand, and the difficulties in transporting heavy collecting-tanks about the country, it was necessary to place some limit upon what was caught.

The number of snakes obtained was not great, and most of these were caught after the rains had commenced in the middle of April. Mountain-streams abounded everywhere, and frogs, chiefly of the genus *Rana*, were plentiful. A fine series of *Rhacophorus* and *Ixalus* were also taken. During the day these tree-frogs were seldom seen. Their small size and fine protective colouration rendering them almost invisible among the bushes in which they lived. Their shrill cries by night, however, guided one quickly to them, and by means of a lantern they were easily found and taken.

Perhaps the two most interesting discoveries of the trip were a new genus of snake, allied to *Xenodermus*, and a new species of the degraded skink, *Dibamus*. A new form of *Gymnodactylus peguensis* was obtained on the plateau, but, with the exception of the common house-geckoes and the equally common *Phyllodactylus siamensis*, the family Geckonidæ was remarkable for its absence... The same can be said of *Tropidophorus*, a single specimen only being obtained, although in search of frogs the collectors were daily working along streams. Three new forms of *Rana* and two of *Megalophrys* are also described in this paper. Want of time has prevented me, for the present, from completing my examination of the *Rhacophorus*, the *Ixalus*, and the smaller species of *Lygosoma*.

On the whole, the Reptilian and Batrachian fauna of the plateau, so far as my examination extends, approximates most nearly to that of the hills of Siam and Southern Burma and the higher hills of the Malay Peninsula. A few species only are related to those of more northern origin.

Types of all the species here described have been presented to the British Museum of Natural History.

Finally, I wish to express my thanks to Mr. G. A. Boulenger, F.R.S., for his valuable help in several difficult determinations.

The following localities were collected in:—

*Tour Cham*, on the sea-coast (lat. 12° N.).

*Daban*, in the foot-hills at 200 metres altitude. Dry, deciduous jungle, but fairly dense.

*Sui Kat* and *Dran*, localities about 6 kilometres apart in the hills, at 1000 metres elevation. Chiefly evergreen jungle, with some useful small swamps.

*Dalat*, *Camly*, *Le Bosquet*, *Arbre Broyé*, localities on the plateau at 1200 to 1800 metres. The country at the two first-named camps was chiefly open pine-forests, but at the two last dense evergreen jungle was met with.

*Langbian peaks*, 2000 metres. Mixed forest, some pine, more oak.

## FIMBRIOS, gen. nov. (Pl. I. fig. 1.)

Teeth subequal, 30-32 in each maxillary; head not very distinct from neck, covered with large shields; eye small, with round pupil; loreal very large, touching the eye, nostril in the anterior part of a large nasal; body slender, scales elliptical, keeled, juxtaposed anteriorly, feebly imbricate posteriorly, those of the outer row larger than the others; ventrals large, rounded; tail rather short, subcaudals single.

Allied to *Xenodermus* Reinhardt.

## FIMBRIOS KLOSSI, sp. n.\*

Nostril in the anterior part of a large, concave nasal; rostral triangular, concave, not visible above; internasals much smaller than the præfrontals and separated from the rostral by a horizontal ridge of the skin; frontal as broad as long, longer than its distance to the end of the snout, much shorter than the parietals; supraocular very small and narrow; præocular small, just touching the frontal; a large square loreal in contact with the eye; two postoculars and a subocular; temporals small, 3+4; 9 or 10 supralabials, the first 5 very small, with strongly raised edges, the last one much elongated; no mental; 12 infralabials, the first 7 very small and with their edges raised like the supralabials, 1st and 2nd pairs in contact with each other; a pair of very large chin-shields.

28 to 30 scales round the anterior part of the body, 30 to 32 round the middle; ventrals 162 to 167; anal 1; subcaudals 43 to 58.

Dark grey above, yellowish (in life white) below, the edges of the posterior ventrals and subcaudals tinged with grey.

Three specimens obtained at Dalat and Camly at 1500 metres. Measurements of the type series in mm.:—

Author's No.	Total length.	Tail.	Ventrals.	Subcaudals.
2144 ♀ .....	395	50	166	43
2145 ♂ .....	345	68	162	57
2143 ♂ .....	310	60	167	58

These remarkable snakes were caught beneath fallen timber. They were quiet and gentle in their movements, and made no attempt to bite when handled. I kept one alive for a few days in the hopes of learning something of its habits, but difficulties of transport prevented my doing this as long as I should have wished.

## ZAMENIS MOI, sp. n.†

Maxillary teeth 18; eye moderately large; rostral considerably broader than deep; internasals shorter than the præfrontals;

\* Named after Mr. C. Boden Kloss, to whom I am indebted for two of the three specimens.

† Named after the Moi people, the aboriginal inhabitants of the country in which it was found.

frontal  $1\frac{1}{4}$  times as long as broad, longer than its distance to the end of the snout, shorter than the parietals; loreal twice as long as high; one pre- and two post-oculars: no subocular; temporals 1+2; 8 supralabials, 4th and 5th touching the eye; 6 infralabials, 4th very large; 4 infralabials in contact with the anterior chin-shields, which are as long as the posterior: posterior chin-shields in contact anteriorly. Scales in 15 rows throughout, entirely smooth; ventrals, rounded, 168; anals 2; subcaudals 103 pairs.

Olive-greenish above, with indistinct, narrow, pale, dark-edged cross-bars on the posterior part of the body and tail. Below yellowish, speckled with grey on the posterior two-thirds; a dark median streak between the subcaudals.

Total length 1000 mm., tail 290.

Allied to *Z. korros* Schleg.

A single male specimen collected at Dran (1000 metres) by Mr. Boden Kloss in May 1917. Author's number, 2153.

#### TROPIDONOTUS JOHANNIS Blgr.

Ann. & Mag. Nat. Hist. (8) ii. 244, Sept. 1908.

Ten examples from the Plateau differ from typical *johannis* only in the supralabial shields. Two of them have 8 on one side, 9 on the other; all the rest have 9. From *T. modestus* Günther, which it resembles very closely, it differs in the fewer caudal shields and in the colouration of the belly.

Variation in my series:—Scales 19–17, ventrals 149–159, caudals 83–98. Five out of the ten specimens have the tail more or less docked. Largest: total length 640 mm., tail 185 (♂).

*Colour.* Brown above, with small black spots, and a series of small yellow ones also present in most. Labials with black sutures, and a yellow streak from the last labial to meet its fellow on the nape. Belly yellowish white, with a black spot at the outer side of each ventral.

#### COLUBER OXYCEPHALUS Boie.

Bouleng., Rept. Malay Pen. p. 143 (1912).

1 ex. from Daban. Scales 23, 23, 15. V. 245. C. 130. Total length 1880 mm., tail 480. Green above, yellowish below, tail pale reddish-buff (in spirits).

#### DENDRELAPHIS SUBOCULARIS Blgr.

Cat. Sn. B. M. ii. p. 89 (1894).

1 ex., Dran. Scales 15, 15, 11. V. 165. C. 98. 8 supralabials.

#### CALAMARIA PAVIMENTATA D. & B.

Cat. Sn. B. M. ii. p. 348 (1894).

Var. UNIFORMIS, nov.

Differs from the present known forms in its distinctive colouration.

Olive-brown above, uniform (no longitudinal lines or collar), below yellowish-white, with a median line along the tail and usually another down the belly. Labials yellow.

10 examples examined. Variation: ♂. V. 143-149; C. 30-34. ♀. V. 166, 167; C. 18, 19.

Type locality, Lungbian peaks at 2000 metres.

Type series, Author's Nos. 2135, 2136, 2137, and 2139.

*TRIMERESURUS MONTICOLA* Günther.

*Lachesis monticola*, Cat. Sn. B. M. iii. p. 548 (1896).

1 ex. The specimen differs from the recognized description in having all the subcaudal shields single, and in having only two rows of scales between the eye and the labials. Wall, however, records one from the Chin Hills (Journ. Bombay N. H. S. xx. p. 775), in which the subcaudals are irregularly single and paired, and I find in the British Museum an example in which there are only two rows of suboculars. For the present, therefore, I regard my specimen as *T. monticola*. Scales 21, 15. Anal 1. V. 132. C. 38. Six scales between the supraoculars.

*GYMNODACTYLUS PEGUENSIS* and subsp.

*G. peguensis*, Bouleng. Rept. Malay Pen. p. 36 (1912).

Two specimens of a *Gymnodactylus* obtained at Camly agree well in characters with the typical form of *G. peguensis*, but differ distinctly in colouration. Both are males, and in both the tails are missing, and it is possible, with more complete material for examination, that the present diagnosis will be found incorrect. I refer them here to *G. peguensis*, and at the same time take the opportunity to describe another colour race which I have obtained in Eastern Siam.

The three forms may be described as follows:—

*GYMNODACTYLUS PEGUENSIS*, forma typica. (Text-fig. 1, A.)

7-8 præanal pores; 9-11 upper and 7-9 lower labials; two series of (6-8) large round spots on the back, or with the spots confluent transversely. Head in the adult with large rounded spots.

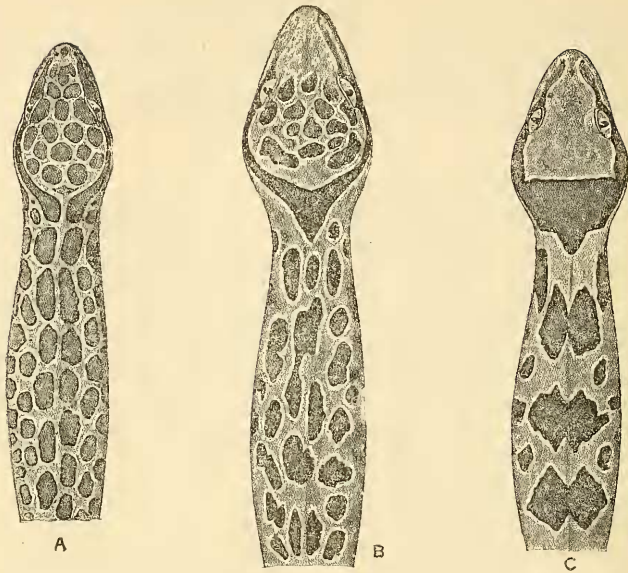
Type locality, Palon, Pegu. Has been found also in other parts of Pegu and in Peninsular Siam as far north as Nakon Sri Tamarat.

Var. *ANGULARIS*, nov. (Text-fig. 1, C.)

10-11 upper and 9-10 lower labials; two series of (4) large angular spots connected mesially. Head in the adult with indistinct angular spots.

*Habitat.* Dong Rek Mts., Eastern Siam.

## Text-figure 1.

*Gymnodactylus peguensis.*A. Forma typica. B. *irregularis*. C. *angularis*.

Measurements of specimens known, in mm. :—

		Head & body.	Tail.	Arm.	Leg.
5364. Lat Bua Kao, Korat (Type).	♀	68	80	27	32
2028. Pak Jong .....	♀	65	70	25	32
2029. Hin Lap .....	juv.	34	35	13	17

Var. *IRREGULARIS*, nov. (Text-fig. 1, B.)

5-7 prænal pores; 8-9 upper and 8-9 lower labials; small angular spots not arranged in any very marked pattern; head with well-marked angular spots.

*Habitat.* Langbian Plateau.

		Head & body.	Arm.	Leg.
4875. Camly (Type).....	♂	79	28	36
4876. " " .....	♂	80	29	37

*CALOTES MICROLEPIS* Blgr.

Fauna Brit. India, p. 134 (1890).

1 ex., Camly. The specimen, a ♀, agrees well with the type in the British Museum. It has 70 scales round the middle of

the body. Head and body, 80 mm.; tail, 180. Brown above, finely speckled with black and yellow. Below whitish, speckled. Black lines radiating from the eyes.

The characters given by Boulenger (Rept. Malay Pen. p. 70) to separate this form from *floweri*, namely narrower head and more compressed tail, will not stand the test of my specimens. I have examined two examples of *floweri* from Chantabun, in addition to the two in the Museum. They have from 50-55 scales round the middle of the body.

I separate *microlepis* as having more scales, 65-70, round the body, smaller ventrals and smaller tympanum; it is possible that *floweri* is only a Southern form of this species.

I have examined pregnant females of both forms. The eggs are oval.

#### CALOTES MYSTACEUS D. & B.

F. B. I. p. 138 (1890).

Specimens obtained at Saigon and on the Langbian Plateau lack the three chocolate spots on the back which appear to characterize the form found west of the Mekong River. Enough, however, is not yet known of this handsome lizard in Burma to name races definitely. The plateau is a considerable extension eastwards of its known habitat.

#### LIOLEPIS BELLIANA Gray.

Bouleng., Rept. Malay Pen. p. 73 (1912).

Var. ANNAMENSIS, nov.

When collecting upon the sea-coast at Tour Cham, before ascending the Plateau, our attention was attracted by the marked difference in colour between the form of *L. belliana* which we observed there, and the one which we knew so well from Siam and the Malay Peninsula. The vivid orange bars upon the flanks of the typical form were replaced by bands of pure white.

A detailed examination of the specimens obtained showed further that, in the number of femoral pores, and in the size of the scales behind the tibia, they differed from the typical form. I distinguish the two as follows:—

#### Forma typica.

13-20, usually 15-18, femoral pores.

7-13, „ 8-10, scales across the back of the middle of the tibia.

Flank with orange and black bars alternating.

*Hab.* Burma, Siam, Malay Peninsula and Archipelago, and S. China\*.

\* Amundale has shown (Rec. Ind. Mus. vii. p. 90, Feb. 1912) that the occurrence of this lizard in S. India is incorrect.

## Var. ANNAMENSIS, NOV.

19-26 femoral pores.

14-22, usually 17-20, post-tibial scales.

Flanks with black and white bars alternating.

*Hab.* Coast of S. Annam.*Specimens examined.*

## Forma typica:—

	Femoral pores.	Tibial scales.
Tavoy .....	15—15	9
„ .....	16—18	10
„ .....	13—14	9
Penang .....	15—16	9
Perak .....	20—20	9
Jalor, Patani.....	17—17	9—10
„ „ .....	16—18	10
Tenasserim .....	16	12
Mergui .....	15	9
Burma .....	20—20	13
Siam .....	16—16	9
„ (Koh Samui) .....	16—17	8
„ (Koh Lak) .....	16—17	9
„ „ .....	16—16	10
Hainan .....	16—16	9
China.....	18	9
„ .....	14—16	11

Var. *annamensis*:—

	Femoral pores.	Tibial scales.
2468. Tour Cham .....	♂. 26—26	16
2469. „ „ .....	♂. 24—24	16
2470. „ „ .....	♀. 24—25	18
2471. „ „ .....	♀. 21—22	17
2472. „ „ .....	22—21	19
2473. „ „ .....	♂. 23—24	20
2474. „ „ .....	21—22	22
2475. „ „ .....	♂. 24—24	16
2477. „ „ .....	20—20	18
2478. „ „ .....	♂. 24—24	19
2479. „ „ .....	♂. 23—24	17
2482. „ „ .....	20—21	14
2483. „ „ .....	♀. 21—21	17
2481. Cap St. Jacques .....	19—20	12
2480. „ „ .....	22—22	18

Types from Tour Cham. Type series, Author's Nos. 2473, 2475, 2480, 2481, 2482, and 2483.



## LYGOSOMA STELLATUM Blgr.

Bouleng., Rept. Malay Pen. p. 87 (1912).

1 ex., Dalat. Before known only from two specimens, the types in the British Museum, from the Larut Hills, Perak. My example differs in that the prefrontals just miss contact, and the black spots on the neck and shoulders are arranged to form a broad vertebral band.

## LYGOSOMA CORPULENTUM, sp. n.

Section *Riopa*. Distance between end of snout and arm twice in distance between axil and groin. Limbs well developed, short, pentadactyl, widely separated when adpressed. Snout obtuse, eyelids scaly, supranasals in contact behind rostral; frontonasals forming a good suture with frontal; prefrontals small; frontal broader than the supraocular, longer than the frontoparietal and interparietal together; parietals in suture behind the interparietal; 4 supraoculars; 2 loreals, posterior longest; 7 supralabials, 6th subocular; temporals small and scale-like; ear-opening small, subcircular, about half the size of the eye-opening, without projecting lobules; a large azygos postmental; 36 smooth scales round the middle of the body; præanals slightly enlarged; digits short, compressed, 4th toe a little longer than the 3rd, 12-13 keeled lamellæ inferiorly.

Head and body, 170; tail, 150 mm.

*Colour in life.* Light chocolate-brown above, mingled with yellowish on the flanks; lips, sides of neck, and throat yellow. Belly brownish-white. Labial shields edged black.

A single specimen obtained at Dalat. Author's No. 2128. Closely allied to *L. bamfyldii* Bartlett, from Borneo, Sumatra, and the Malay Peninsula, from which it differs in the absence of lobules to the ear-opening, number of scales round the body, colour of the head, and size.

## DIBAMUS MONTANUS, sp. n. (Text-fig. 2.)

Snout covered with 7 more or less complete shields; a high, narrow rostral, well visible above; a pair of prefrontals, separated

Text-figure 2.



*Dibamus montanus*. Side and upper view of head.

from the 1st labial by a suture running backwards from the nostril, but fused with the labial anteriorly, the nostril thus

lying between the 1st labial and prefrontal; a long 2nd labial\*. Other head-shields as in *D. argenteus* Taylor and *D. nova-guineæ* D. & B., viz. an enlarged frontal and a larger interparietal, an ocular and an enlarged scale behind the 2nd labial on either side. Mental narrow, trapezoid, with a pair of long infralabials.

24-26 scales round the middle of the body, scales imbricate and subequal. Præanals enlarged. Light chocolate-brown above, paler below.

Types, ♂ & ♀. Author's Nos. 4864, 4865. From Le Bosquet. Measurements of specimens in mm. :—

<i>Le Bosquet.</i>				
		Total length.	Tail.	Diameter, mid-body.
♂ . 4865	.....	145	23	5
♀ . 4864	.....	145	21	5
<i>Daban.</i>				
♀ . 2609	.....	112	?	3
♂ . 2608	.....	115	20	3
♀ . 5365	.....	70	11	2.5
♀ . 5366	.....	86	16	2.5
♀ . 5367	.....	65	12	2

In the length of the tail (which from this table appears to be comparatively longer in the young than in the adult) *D. montanus* resembles *D. argenteus* from the Philippines. From it also, as well as from *D. nova-guineæ*, it differs in the greater differentiation of the shields of the snout.

#### RANA MILLETTI, sp. n. (Pl. II. fig. 2.)

Vomerine teeth in oblique series, commencing from the anterior borders of the choanæ and extending beyond their posterior borders, the distance between them equal to their distance from the choanæ. Head a little longer than broad, snout obtusely pointed, projecting beyond the mouth, longer than the eye; canthus rostralis distinct; loreal region slightly oblique, strongly concave; nostril distinctly nearer the tip of the snout than the eye; distance between the nostrils greater than the interorbital width, which is equal to or a little greater than the upper eyelid; tympanum very distinct,  $\frac{2}{3}$ – $\frac{3}{4}$  the diameter of the eye, and  $2\frac{1}{2}$ –3 times its distance from the eye.

Fingers rather long, 1st longer than 2nd; tips with small but distinct discs, which may bear a feeble groove separating the upper from the lower surfaces; subarticular tubercles large and prominent; discs of the toes larger than those of the fingers, and with a distinct groove separating the surfaces; toes  $\frac{1}{3}$  webbed; outer metatarsals separated nearly to the base; subarticular

\* In the two adult examples from Le Bosquet (1200 metres) the shields are as described, but in five juveniles from Daban (200 metres) the sutures are feebly evident or entirely absent.

tubercles prominent; no tarsal fold; inner metatarsal tubercle  $2\frac{1}{2}$ -3 times in length of inner toe; a small, prominent rounded outer tubercle; tibio-tarsal articulation reaching to the tip of the snout or not quite so far; tibia  $1\frac{3}{4}$ - $1\frac{5}{6}$  in distance from snout to vent; heels overlap when the limbs are folded at right angles to the body.

Skin of the back finely granular; a prominent and fairly broad dorso-lateral fold from the eye to the hip.

Yellowish-brown or greyish-brown above, sometimes with indistinct darker markings; sides of the head dark brown; limbs with indistinct dark bars; below yellowish.

Males without vocal sacs, with a large, flat, humeral gland, and a small pad on the first finger.

Allied to *R. adenopleura* Blgr., from Formosa, from which it differs in the more slender habit, less extensive webbing to the feet, the web not reaching the discs of any of the toes, and in colouration.

Eggs pigmented, the vitelline sphere measuring 2 mm. in diameter.

Type locality, Dalat. Numerous specimens were obtained in the type locality, from the Langbian peaks, and from Dran.

I have named this frog after Monsieur Millet, Conservator of Forests to the French Government, who gave us every help possible while travelling upon the Plateau.

Measurements of type series in mm.

Author's Nos.	5119	5128	5129	2571	2600	2602	4818	5103	5107	5176
Snout to vent..	48	47	47	45	46	37	36	36	37	29
Head .....	16	17	16	16	17	14.5	14	14	14	14
Width of head	15	16	15	15	16	13	12.5	12.5	13.5	14
Snout .....	7	7	7	7	8	6	6	6	6	6
Eye .....	5	5	5	5	5	4.5	4.5	4	4	4
Interorbital ...	4.5	4	4	5	5	3.5	3.5	3	4	4
Tympanum ...	4	4	4	4	4	3.5	3.5	3.4	4	3.5
Arm .....	29	27	28	27	27	22	21	23	22	24
Leg .....	85	79	79	81	81	64	64	62	63	67
Tibia .....	27	25	27	27	26	20	20	20	20	21
Foot ... ..	27	25	25	26	26	20	20	20	20	21
	♀	♀	♀	♀	♀	♂	♂	♂	♂	♂
	Dalat.	Dalat.	Dalat.	Dran.	Dalat.	Dalat.	Dran.	Dran.	Dran.	Lang bian.

*RANA NIGROVITTATA* Blyth.

Boulenger, Rec. Ind. Mus. xx. p. 144, June 1920.

Boulenger's Monograph on the Asiatic *Ranae* omits any statement of localities, or measurements of specimens of this species. It is known from Southern Burma to the Man Son Mts., Tonkin. On the hills in Northern Siam it is very common, and I obtained specimens on the plateau at Sui Kat, Dran, and Dalat. Boulenger further describes the male as having internal vocal vesicles, but I have many specimens in which the skin of the

throat is pigmented, and sufficiently differentiated, to entitle the sacs to be called external.

In general appearance *R. nigrovittata* very closely resembles *R. mortenseni* from S.E. Siam. *R. mortenseni*, however, has no groove at all to the finger discs, grows to a larger size, and the male has internal vocal sacs. Adult males cannot be confused, but immature specimens or females could be mistaken. *R. mortenseni* appears to be confined to the Island of Chang. The specimens identified by Boulenger as having been obtained in the Kariu Hills (N. Siam), Monograph, No. 5 & 6, p. 136, should, I feel sure, be referred to *nigrovittata*. The tadpole also, as originally described by me under *nigrovittata*, should stand as correct.

I give measurements of some specimens in the British Museum which I have examined.

	Byngyi Mts., Burma.		Mergui.	Klong Bang Jai, P. Siam.			Me Wang, P. Siam.		Langbina Plateau.	Maan Son Mts., Tonkin.	
Snout to vent .....	49	50	49	52	42	44	54	46	56	49	42
Head .....	19	19	17	18	14	16	18	16	18	17	16
Width of head.....	18	19	16.5	17	14	15	18	17	18	17	16
Snout .....	8	8	7	8	6	6.5	7	6.5	7	7	6
Eye .....	5.5	5.5	6.5	6	4.5	5	6	5	6	5	4.5
Tympanum .....	4	4	4	4	3	2.5	4	3.5	4	3.5	3.5
Arm .....	28	29	28	28	27	28	30	23	32	30	28
Leg .....	82	84	80	85	70	76	84	73	85	84	75
Tibia .....	26	28	27	27	22	25	27	22	27	25	24
Foot .....	26	28	25	25	21	22	27	22	26	25	24

#### RANA SAUTERI Boulenger.

Rec. Ind. Mus. xx. p. 143, June 1920.

Var. JOHNSI, nov.\* (Pl. II. fig. 1.)

Eleven specimens of a frog from the Plateau differ sufficiently from *R. sauteri* Boulenger, from Formosa, to be entitled to racial distinction. I have compared them with types in the British Museum, and separate them on the following grounds:—

More pointed snout, longer leg, tibio-tarsal articulation to well beyond the snout, very prominent glandular dorso-lateral fold, and smaller size.

In other points also, Boulenger's description, drawn up from four females, shows small variations, and I therefore describe my specimens in detail.

Vomerine teeth in oblique groups between the choanæ and extending beyond their posterior borders, as far from the choanæ as from each other, or a little farther.

Head as long as, or a little longer than broad, depressed; snout obtusely pointed, projecting beyond the mouth, longer than

\* Named after Mr. Johns, British Consul in Saigon at the time of our visit, and who was of the greatest assistance to us in arranging many details of our expedition.

the eye; distance between the nostrils considerably greater than the interorbital width, which is equal to the upper eyelid; tympanum very distinct,  $\frac{2}{3}$ - $\frac{3}{4}$  the diameter of the eye, which is 3-4 times as long as its distance from the latter.

Fingers moderate, the tips swollen into very small discs which do not bear a groove; 1st longer than 2nd; subarticular tubercles large and prominent.

Hind limb long and slender, the tibio-tarsal articulation reaching far beyond the snout; heels strongly overlapping when the limbs are folded at right angles to the body; tibia 5-6 times as long as broad,  $1\frac{1}{3}$ - $1\frac{1}{2}$  times in length from snout to vent, longer than the foot. Toes with small discs, more developed than those of the fingers, and bearing a groove separating the upper from the lower surfaces; web reaching to the disc of the 5th toe and to the 3rd on its outer side, last two phalanges of 4th free. Outer metatarsals separated nearly to their base; no tarsal fold; subarticular tubercles strongly developed; inner metatarsal tubercle oval, prominent,  $\frac{1}{3}$ - $\frac{1}{4}$  length of inner toe; a very small round, distinct tubercle at the base of the 4th toe.

Skin smooth or very finely granulate, a few enlarged scattered tubercles on the back, a  $\wedge$ -shaped glandular fold between the shoulders, and short oblique folds crossing the thighs and tibiae; a narrow, prominent, dorso-lateral fold from the eye to the hip, and two short folds from behind the tympanum enclosing a triangular black patch.

Greyish-brown above, uniform or faintly mottled with darker; a well-defined, rich, dark brown patch from the eye to the shoulder, enclosing the tympanum; snout below the canthus rostralis darkish; limbs with narrow dark cross-bars; a brown streak along the back of the arm and another along the front of the tibia. Below whitish, the chest and throat speckled with grey.

Males with internal vocal sacs, and a brown nuptial prominence on the 1st finger.

Types from Sui Kat. Type series, Author's Nos. 2638, 2639, 2640, 2641, 2644, 2657.

#### Measurements in mm.

Author's Nos.	5081	2657	2642	2639	2640	2641	5087	2638	2644	2645	2457
Snout to vent.	45	43	42	43	40	50	43	42	42	41	40
Head .....	15	14	14	14	13	16	15	15	14	13	13
Width of head	14	14.5	14.5	14	13	15	14	14	14	13	12.5
Snout .....	6	6.5	6	6	5.5	7	6.5	6.5	6.5	6	6
Eye .....	4.5	4.5	4.5	4.5	4	5.5	5	4.5	4.5	4.5	4.5
Interorbital ..	3.5	3	3	3	3	4	3.5	3	3.5	3	3
Tympanum ..	3.5	3.5	3	3	3.5	3.5	3.5	3	3.5	3	3
Arm .....	26	25	25	25	25	29	26	24	25	23	22
Leg .....	87	81	81	82	77	100	81	78	81	77	75
Tibia .....	28	27	27	27	26	34	28	27	27	26	25
Foot .....	26	25	25	25	23	30	25	25	25	23	22
	♂	♂	♂	♂	♂	♀	♀	♀	♀	♀	♀

*RANA MONTIVAGA*, sp. n. (Pl. I. fig. 2.)

Vomerine teeth in short oblique groups between the choanæ, and extending beyond their posterior margins. Head broader than long; snout rounded, scarcely projecting beyond the mouth, longer than the eye; canthus rostralis strong; loreal region oblique, deeply concave; nostril a little nearer the tip of the snout than the eye; distance between the nostrils greater than the interorbital width, which is equal to the width of the upper eyelid; tympanum very distinct, about half the diameter of the eye,  $1\frac{1}{2}$ - $2\frac{1}{2}$  times its distance from the latter.

Fingers moderate, terminating in small discs which bear a groove separating the upper from the lower surface; 1st a little longer than the 2nd; subarticular tubercles large and prominent. Hind limb long and shapely; tibio-tarsal articulation reaching to far beyond the snout; heels strongly overlapping when the limbs are folded at right angles to the body; tibia  $1\frac{1}{2}$ - $1\frac{2}{3}$  times in length of head and body, much longer than the foot. Toes with well-developed discs, which are larger than those of the fingers and bear a strongly-marked groove; web reaching to, and including a portion of the discs of all the toes, but in the case of the 4th it is continued on as a narrow fringe from the 2nd phalanx; outer metatarsals separated nearly to the base, subarticular tubercles large and prominent; a feeble tarsal fold; inner metatarsal tubercle oval,  $2\frac{1}{2}$  times in length of inner toe; no outer tubercle.

Skin above granular, with larger tubercles; a narrow, prominent, dorso-lateral fold from the upper eyelid to the hip, strongest in front, sometimes broken up. Lower parts smooth.

Yellowish-brown or greyish-brown above, usually with indistinct blackish markings; sides of the head darker; limbs with dark cross-bands. Below yellowish-white, usually powdered with brown on the throat and chest.

Males smaller than females, with internal vocal sacs.

Types from Dalat, Langbian Plateau, at 1500 metres.

Allied to *R. varians* Blgr., from Celebes and the Philippine Islands; from which it differs in the stouter habit, broader

Measurements of type series in mm.

Author's Nos. ...	5124	5123	5126	2572	5013	4826	2529	2530	4829	5022
Snout to vent ...	48	48	48	46	48	75	72	71	66	58
Head.....	17	16	18	16	17	25	23	24	22	21
Width of head...	18	18	17.5	16	17	26	25	26	24	20.5
Snout .....	6.5	7.5	7	7	7	10	11	11	10	9
Eye .....	6.5	6.5	6	6	6	8	8	9	8	7.5
Interorbital .....	5	5	5	4	4	6	6	7	6	6
Tympanum .....	4	4	4	3	3	4.5	5.5	5	5	4.5
Arm .....	28	30	30	28	31	43	44	47	40	34
Leg .....	98	94	95	93	96	140	135	138	138	111
Tibia.....	32	32	32	30	31	44	45	45	42	39
Foot .....	30	28	29	27	27	37	41	37	38	34
	♂	♂	♂	♂	♂	♀	♀	♀	♀	♀

head, shorter and more rounded snout, and absence of external metatarsal tubercles.

This frog was common on the Plateau, and numerous specimens were obtained at between 1500 and 2000 metres elevation.

*RANA GRAMINEA* Boulenger.

P. Z. S. 1899, p. 958, pl. lxxvii. fig. 1; id., Rec. Ind. Mus. xx. p. 204, June 1920.

Boulenger's description was drawn up from male specimens only. A fine series from the Plateau shows that the females are much larger than the males, some of them being twice as large. The specimens differ from the types in the snout being longer than the eye, and in the nostrils being distinctly nearer the tip of the snout than the eye. Females have a proportionately smaller tympanum than males.

*Colour.* Above bright green to dark olive, or greyish-brown, uniform or with large darkish spots. Below white, uniform or powdered with grey. Females usually light greyish-brown above, seldom bright green, and conspicuously spotted on the back and limbs.

This frog was common on the Plateau at all elevations above 1500 metres.

Measurements of *R. graminea* in mm.

Author's Nos....	2515	2513	2518	2526	2647	2506	2509	2510	2648	2649
Snout to vent ...	58	53	56	45	40	105	101	89	79	72
Head .....	22	20	20	17	15	35	34	29	27	25
Width of head...	20	18	18	16	14.5	35	35	32	27	25
Snout .....	10	9	9	7	6.5	17	16	14	13	11
Eye .....	9	7	7	5.5	5.5	11	11	10.5	8	8
Interorbital .....	4.5	4.5	4.5	4	3.5	9	9	8	8	6
Tympanum .....	4.5	4	4.5	3.5	4	6	5	4.5	4	4
Arm .....	35	34	34	31	30	66	66	60	52	49
Leg .....	96	94	94	85	76	190	190	168	150	150
Tibia.....	32	32	30	29	25	65	65	59	52	53
Foot .....	28	28	27	24	22	54	54	46	46	44
	♂	♂	♂	♂	♂	♀	♀	♀	♀	♀

*MICROHYLA PICTA* Schlegel.

Verh. Nat. Ges. Basel, xiii. 1901, p. 151, fig.

Known from a single specimen in the Basel Museum.

Dr. Roux has kindly compared one of my specimens with it, and considers them to be identical. In general characters *M. picta* agrees so closely with *M. rubra* from India that, were it not for the distinctive colouration of the two forms and their geographical distribution, it would be difficult to separate them. Comparing my specimens with examples of *M. rubra* in the British Museum, I find the following differences:—Snout (of *picta*) a little more obtuse, tibio-tarsal articulation reaching to posterior border of eye, web of toes slightly fuller.

*Colour.* Greyish or yellowish above, with a large dark white-edged mark on the back, commencing between the eyes and diverging about the middle into two arms which run to the groin. Dark markings along the sides parallel to it, and often a second  $\wedge$  over the sacral region. Limbs with dark bars. Below yellowish, the males with blackened throats.

*M. picta* is found in Cochin China (type locality unknown), *M. rubra* in India and Assam.

I found this little frog one night in April at Cap St. Jacques, where it was breeding in the ditches beside the road, not far from the sea. We were attracted by the strident voices of the males, and without difficulty captured large numbers.

#### BUFO GALEATUS Günther.

Rept. Brit. India, p. 421 (1864).

*B. galeatus* was described by Günther from a single specimen obtained by Mouhot in Cambodia. A series of eight specimens obtained at Dran in April enables me to enlarge his original diagnosis, and I take this opportunity to re-describe the species.

Canthus rostralis with strong bony ridges, which are continued backwards more or less distinctly over the supraorbital and parietal regions. A thick, arched, elevated orbito-tympanic ridge, separated by a slight depression from the parotid gland, which is about as long as the bony ridge; snout short, blunt; tympanum very distinct, two-thirds diameter of eye. 1st finger distinctly longer than 2nd; toes one-third to nearly half webbed; two well-marked metatarsal tubercles, the inner nearly twice as large as the outer; no tarsal fold; tibio-tarsal articulation reaching to tympanum in male, not so far in female. Upper parts with prominent warts, which become spiny on the flanks: lower parts coarsely granular; parotids prominent, elongate, about as long as the orbito-tympanic ridge.

Reddish or greyish-brown above, with dark marblings on the back, the limbs with dark bars; bars upon the lips. Dirty yellow or whitish below, more or less distinctly spotted with black.

Males considerably smaller than females and with black nuptial asperities on the inner two fingers.

#### Measurements in mm.

Author's Nos. ....	2426	2427	2428	2492	2132	2592	Type
Snout to vent.....	85	70	61	62	50	43	63
Snout to ant. border of tympanum } .....	23	17	17	17	13	11	16
Width of head .....	35	27	25	24	18	15	27
Fore limb .....	56	44	40	45	36	33	42
Hind limb .....	99	81	72	83	67	59	82
Tibia .....	32	26	24	27	22	19	25
Foot .....	32	25	23	25	20	18	24



## MEGALOPHRYS INTERMEDIUS, sp. n.

A form intermediate between *M. carinense* and *M. feci*, differing from the latter in the web between the toes, and from the former in the more posterior position of the vomerine teeth, and from both in several other small points.

Tongue feebly nicked behind. Vomerine teeth present in two widely-separated groups just behind the level of the choanæ. Head large and depressed,  $1\frac{3}{4}$ -2 times as broad as long; snout rounded, hardly as long as the eye, not projecting beyond the lower jaw; canthus rostralis very distinct; loreal region slightly oblique, feebly concave; nostril equidistant from the eye and the snout; interorbital space  $1\frac{1}{2}$  times to nearly twice as broad as the upper eyelid; tympanum hidden. Fingers short, with feebly swollen tips, 1st and 2nd about two-thirds length of 3rd; no sub-articular tubercles; metacarpal tubercles very indistinct; toes with feebly swollen tips one-third to one-half webbed, the web extending as a fringe along either side; no subarticular tubercles; a large oval, flat, inner metatarsal tubercle; tibio-tarsal articulation reaching to nearly, or quite, the commissure of the jaw; tibia one-third to two-fifths in length of head and body; foot longer than the head. Upper eyelid with conical tubercles, one of which is enlarged to form a short horn; an oblique glandular fold on the back parallel with the supratemporal fold usually present; more or less distinct oblique folds across the limbs, throat finely granulate, belly nearly smooth.

*Colour in life.* Above bronze or dark coppery, the head and fore part of the body, outside the dorsal glandular fold, usually lighter. Back usually with indistinct light and dark markings; arms and legs with dark cross-bands; a dark patch over the region of the tympanum and dark bars below the eye. Below dark brown to bronze, paler on the belly. Dorsal fold and tubercles on the flanks black on their inferior aspect, light

## Measurements of type series in mm.

Author's Nos. ....	2070	2073	2075	2078	2067	2086	2074	2085	2076	2084	2083
Snout to vent .....	92	94	103	92	94	97	99	103	86	63	43
Head (to occiput)...	27	25	26	25	25	25	25	28	23	18	14
Width of head.....	50	46	49	47	48	46	48	51	44	30	22
Length of snout ...	12	12	13	12	12	12	12	12	11	9	6.5
Diam. of eye.....	9	9	9	9	8	9	8	10	8.5	5	5
Interorb. width ...	13	13	13	12	13	12	13	12	12	9	7
Fore limb.....	52	51	50	48	54	52	54	58	50	32	23
Hand.....	25	25	24	24	24	24	26	27	23	16	12
Hind limb } (to artic.) } .....	114	116	110	114	115	115	115	118	100	69	50
Tibia.....	36	39	36	36	36	35	36	37	32	22	15
Foot .....	37	39	35	36	38	38	38	42	32	22	17
	♀	♂	♂	♂	♂	♂		♂	♂	♀	♀

superiorly. Young with paler (yellowish) head and shoulders, and with the markings more clearly defined.

21 specimens examined.

This fine *Megalophrys* was common on the Plateau above 1500 metres, and the loud, harsh croakings of the males could be heard at all times of the day and night. It was by means of their call that most of them were discovered and finally tracked down to their hiding-place in some deep crevice between the rocks or boulders of the streams in which they lived.

MEGALOPHRYS HASSELTII Tschudi.

Bouleng., Fauna Malay Pen. p. 282 (1912).

Var. PULLUS, nov.

Differs from the typical form in the longer and more prominent metatarsal tubercle (at least twice as long as broad), longer leg (to tympanum), smaller size, and in colouration. Toes  $\frac{1}{3}$  webbed.

Dark grey above, sometimes with indistinct darker markings. Limbs with alternate dark and light cross-bars. Below whitish or brownish. Upper half of iris (in life) scarlet.

Type locality, Arbre Broyé. Also found at Camly.

Altogether 20 specimens were obtained, which I have been able to compare with some 20 examples of the typical form from Siam and the Malay Peninsula.

Measurements of type series in mm.

Author's Nos.....	2093	2101	2108	2091	2103	2090	2105	5192
Snout to vent .....	49	44	52	45	44	45	44	49
Head.....	17	15	18	15	15	16	15	17
Width of head .....	21	19	22	20	19	19	18	21
Interorbital .....	6	5	7	5.5	5	5.5	5.5	5.5
Arm .....	30	27	38	27	29	28	29	34
Hand .....	12	10	13	10	10	10	10	12
Leg .....	56	50	62	51	52	51	50	56
Tibia.....	17	15	18	15	15	15	15	17
Foot .....	17	16	18	15	15	15	15	17
	♀	♀	♀	♂	♂	♂	♂	♂

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. *Fimbrios klossi*.

2. *Rana montivaga*. (Nat. size.)

PLATE II.

Fig. 1. *Rana sauteri* var. *johnsi*. (Nat. size.)

2. *Rana milleti*. (Nat. size.)